

Recovery Plan Action Status

Plan Name: Revised Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California

Plan Status: Final Revision 1

Plan Date: 25-Apr-84

Lead Agency: USFWS

Lead Office: Sacramento Fish And Wildlife Office

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Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	1	1111	Acquire Sardis property	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Division of Realty	Acquisition: Fee Title	Contract, Internal Technical Assistance	Purchase completed in FY 80, \$2.2 million
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	1	1112	Acquire Stamm-Starr property	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Division of Realty	Acquisition: Fee Title	Contract, Internal Technical Assistance	Purchase completed in FY 80 within aquisition of Sardia property

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Lange's metalmark butterfly (<i>Apodemia mormo langei</i>), Contra Costa wallflower (<i>Erysimum capitatum</i> var. <i>angustatum</i>), Antioch Dunes evening-primrose (<i>Oenothera deltoides</i> ssp. <i>howellii</i>)	1	1114	Manage refuge lands	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service National Wildlife Refuge System	Management	Internal Field Assistance, Internal Technical Assistance	Ongoing AWR PA obj.
Lange's metalmark butterfly (<i>Apodemia mormo langei</i>), Contra Costa wallflower (<i>Erysimum capitatum</i> var. <i>angustatum</i>), Antioch Dunes evening-primrose (<i>Oenothera deltoides</i> ssp. <i>howellii</i>)	2	1121	PG&E MOU	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Endangered Species Division	Acquisition: Management Agreement	Internal Technical Assistance	Safe Harbor agreement with Partners Program at SFWO will allow PG and E to conduct O and M at their sites in the Sardis Unit. Safe Harbor agreement is completed.

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Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	1122	Domtar MOU	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Endangered Species Division	Acquisition: Management Agreement	Internal Technical Assistance	
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	1123	McCullough MOU	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Endangered Species Division	Acquisition: Management Agreement	Internal Technical Assistance	
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	121	Develop with other owners habitat management plan	Ongoing Current	FY 2008		U.S. Fish and Wildlife Service, Endangered Species Division, California Department of Fish and Game	Other: Administration	Internal Technical Assistance	Have contacted surrounding businesses and developed verbal agreements.
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	122	Other essential habitat MOU	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Endangered Species Division, California Department of Fish and Game	Acquisition: Management Agreement	Internal Administrative	

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Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	123	Identify other essential habitats	Partially Complete	FY 2006		U.S. Fish and Wildlife Service, Endangered Species Division, California Department of Fish and Game	Research: Habitat Status	Internal Field Assistance	In spring 2008 conducted survey of Antioch Dunes Evening Primrose at the Brannan Island State Park.
Lange's metalmark butterfly (Apodemia mormo langei)	2	211	Annual census of Lange's metalmark butterfly	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Endangered Species Division	Research: Population Surveys	Internal Field Assistance, Volunteer	Ongoing continuously since 1986. Annual variation, but a declining trend in last decade.

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Lange's metalmark butterfly (Apodemia mormo langei)	1	212	Captive breeding of Lange's metalmark butterfly	Ongoing Current	FY 2007		U.S. Fish and Wildlife Service, Endangered Species Division	Management: Propagation	Contract, Species Expert	FY 82 PA Obj. 5d(9). Project was postponed due to higher recovery needs. CVPCP funding in 2007 allows the start of a new captive propagation program. Warranted by low numbers from recent surveys. Captive propagation was successful at Moorpark College during 2007 - 2010. Adult peak count in 2008 was 131, which is an increase from the peak count of 42 in 2006. Over 100 larvae were released at the Stamm Unit in 2008 and 2009. Restoration of habitat is ongoing and has produced healthy stands of buckwheat host plant to support the augmentation of Lange's metalmark butterfly larvae. Over 100 captive propagated larvae released to the Stamm Unit in Summer 2010.

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Lange's metalmark butterfly (<i>Apodemia mormo langei</i>)	2	213	Develop and implement habitat restoration plan for Lange's metalmark butterfly	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service National Wildlife Refuge System	Management: Habitat Maintenance and Manipulation, Management: Planning	Internal Field Assistance, Internal Technical Assistance, Volunteer	Restoration is ongoing at the ADNWR. Host plant for Lange's has been outplanted and is appearing in healthy stands throughout the refuge. Sand is being imported to replace mined sand. Invasive plants and thach is annually removed by the California Conservation Corps and volunteers.
Lange's metalmark butterfly (<i>Apodemia mormo langei</i>)	2	214	Conduct life history studies of Lange's metalmark butterfly	Ongoing Current	FY 2007		U.S. Fish and Wildlife Service, Endangered Species Division	Research: Other Information	Contract, Internal Field Assistance, Internal Technical Assistance, Species Expert	During captive propagation studies on life history are being conducted.
Lange's metalmark butterfly (<i>Apodemia mormo langei</i>)	1	215	Outplant host plant for Lange's metalmark butterfly	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service National Wildlife Refuge System	Management: Propagation	Contract, Internal Field Assistance, Internal Technical Assistance, Volunteer	Outplanted buckwheat is growing in very healthy stands throughout the refuge. In 2008-2009 over 1000 plants were outplanted. Many volunteer plants from seed bank sprout as invasive plant and thach removal reveals bare sandy soil.
Lange's metalmark butterfly (<i>Apodemia mormo langei</i>), Contra Costa wallflower (<i>Erysimum capitatum</i> var. <i>angustatum</i>), Antioch Dunes evening-primrose (<i>Oenothera deltoides</i> ssp. <i>howellii</i>)	2	24	Rebuild natural dune topography with dredge spoil sand	Ongoing Current	Prior to FY 1995		Port of Stockton, California, U.S. Fish and Wildlife Service National Wildlife Refuge System, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Internal Field Assistance, Volunteer	80 truckloads costing \$25K were delivered in FY2009. New funding in FY 2011 will allow for additional sand acquisition. Plan is to place sand at the west end of Stamm Unit.

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Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	25	Remove exotic vegetation including vineyard	Ongoing Current	Prior to FY 1995		California Native Plant Society, U.S. Fish and Wildlife Service National Wildlife Refuge System, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Internal Field Assistance, Volunteer	
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	31	Interpretive signs	Complete	Prior to FY 1995	FY 2008	U.S. Fish and Wildlife Service National Wildlife Refuge System	Other: Information and Education	Internal Field Assistance	Signs are in place at both Stamm and Sardis Units.
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	32	Prepare, print, and distribute information leaflets	Ongoing Current	Prior to FY 1995		California Native Plant Society, U.S. Fish and Wildlife Service National Wildlife Refuge System, California Department of Fish and Game	Other: Information and Education	Internal Field Assistance, Internal Technical Assistance	
Lange's metalmark butterfly (Apodemia mormo langei), Contra Costa wallflower (Erysimum capitatum var. angustatum), Antioch Dunes evening-primrose (Oenothera deltoides ssp. howellii)	2	33	Develop environmental education program	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service National Wildlife Refuge System	Other: Information and Education	Internal Field Assistance, Internal Technical Assistance, Volunteer	Refuge staff works with local schools for volunteer service and education days on the refuge grounds.